

## REMARKS

Reconsideration and the timely allowance of the pending claims, in view of the following remarks, are respectfully requested.

In the pending Office Action, the Examiner rejected claims 1-2, 4-5, and 10, under 35 U.S.C. §102(b), as being anticipated by Inoue '957 (U.S. Patent No. 5,786,957); and rejected claims 7-9 and 11, under 35 U.S.C. §103(a), as being unpatentable over Inoue '957.

Prior to this Amendment, claims 1-11 were pending. By this Amendment, Applicant has amended claims 1-2, 4, 7-8, and 11 to provide a better presentation of the claimed invention and has cancelled claims 3, 5-6, and 9, without prejudice or disclaimer.

Applicants respectfully traverse the rejections under 35 U.S.C. 35 §§102(b), 103(a) for the reasons presented below.

### I. Rejections Under 35 U.S.C. §102(b)

Independent claim 1, as amended, sets forth a disk drive having a perpendicular magnetic recording system and a head that performs read and write operations in accordance with the perpendicular magnetic recording system, in which the disk drive comprises:

a disk medium including a magnetized area corresponding to data recorded with the perpendicular magnetic recording system and the head and *a servo area on which servo data coded with the DC free code is recorded . . .*

wherein the *servo data is used for the position control of the head.*

Consistent with the embodiments disclosed in the specification, the invention of claim 1 is directed to a disk drive having a perpendicular magnetic recording system that comprises a disk medium that includes recorded servo data in the servo area of the

disk medium. The servo data is used for position control of a head. The recorded servo data is encoded with a DC free code. In this manner, the present invention employs the disk medium having the recorded DC free encoded servo data so as to obtain the read signal with a suppressed DC component. In contrast to conventional perpendicular magnetic recording disk drives in which the read signal waveforms include a DC component that contribute to distortions, the DC free code of the present invention is used to obtain the read signal waveform that has a suppressed DC component. As such, claim 1 positively recites that the servo area includes recorded servo data coded with DC free code.

Unlike the present invention, however, the Inoue '957 reference fails to teach the combination of a disk drive having a perpendicular magnetic recording system in which a disk drive includes a servo area in which servo data coded with the DC free code is recorded, as required by independent claim 1. In contrast to the Examiner's assertions, Inoue '957 does not teach a method to "generate a DC in the servo area". (*Office Action*, page 3, lines 1-3). What Inoue '957 does teach is a magnetic disk drive comprising head tracking servo means for providing a positioning offset to the composite magnetic head such that the write head is set to be on-track in the data area of the magnetic disk during a write operation and the read head is set to be on-track in the data area of the magnetic disk during a read operation. (*See*, col. 4, lines 40-45). According to Inoue '957, when a servo pattern is read by an MR head, it is possible to avoid generating a DC offset when reading head positioning information of head positioning data, thereby making it possible to achieve correct positioning. (*See*, col. 4, lines 47-52).

In fact, as best as can be determined from the comprehensive Inoue '957 reference, there is absolutely nothing that suggests the use of recording servo data encoded with the DC free code in the servo area, as required by independent claim 1.

For at least the reasons discussed above, Applicant submits that amended independent claim 1 is not anticipated by the Inoue '957. Moreover, as best as can be determined, none of the references of record whether considered alone, or in reasonable

combination with Inoue '957, teach the combination of elements recited by amended independent claim 1. As such, claim 1 stands as novel and patentable over the references of record. In addition, claim 2 is also patentable by virtue of its dependency to claim 1 as well as for its additional recitations. Furthermore, because independent claim 10 recites similar features claim 1, claim 10 is also patentable for at least the reasons presented with respect to claim 1. Accordingly, withdrawal of all prior art rejections of claims 1-2 and 10, under 35 U.S.C. § 102(b) is respectfully requested.

Independent claim 4, as amended, sets forth a disk drive having a perpendicular magnetic recording system on which a magnetized area corresponding to data recorded on the perpendicular magnetic recording system is formed in a perpendicular direction, the disk drive comprising, *inter alia*:

a read channel having a predetermined cut-off frequency characteristics *f<sub>c</sub>* that eliminates low frequency component of a read signal . . .

wherein said disk medium includes *a servo area in which servo data is recorded*, said servo data being used to control position of said head, said *recorded servo data comprising coded data in which the sum total of the length in the longitudinal direction of the area having a positive polarity of said magnetized area and the sum total of the length in the longitudinal direction of the area having a negative polarity become equal to each other* . . .

As noted above regarding independent claim 1, the Inoue '957 reference fails to teach or suggest the recordation of coded servo data in the servo area. Equally important, is the fact that there is nothing in the Inoue '957 reference that remotely teaches or suggests coded data configured to have the sum total of the length in the longitudinal direction of the area having a positive polarity of the magnetized area and the sum total of the length in the longitudinal direction of the area having a negative polarity equal to each other, as recited by claim 4.

For at least these reasons, Applicants submit that amended independent claim 4 is not anticipated by the Inoue '957. Moreover, as best as can be determined, none of the references of record whether considered alone, or in reasonable combination with

Inoue '957, teach the combination of elements recited by amended independent claim 4. As such, claim 4 also stands novel and patentable over the references of record. Accordingly, withdrawal of the prior art rejection of claim 4, under 35 U.S.C. § 102(b) is respectfully requested.

II. Rejections Under 35 U.S.C. §103(a)

Independent claim 7, as amended, sets forth a disk drive having a perpendicular magnetic recording system, a disk medium on which a magnetized area corresponding to data recorded on said perpendicular magnetic recording system is formed, and a head configured to perform read and write operations of the data, the disk drive comprising, *inter alia*:

a read channel having a predetermined cut-off frequency characteristics  $f_c$  for extracting a read signal waveform whose level changes at a magnetization transfer position of the magnetization area . . .

wherein said disk medium has a *servo area in which servo data is recorded*, said servo data being used to control position of said head, *the recorded servo data comprising coded data in which the minimum magnetization reverse interval time  $T_{min}$  of said magnetized area satisfies the following condition:*

$$T_{min} \leq (-\ln N)/2\pi f_c,$$

wherein  $f_c$  is a predetermined cut-off frequency of said read channel for eliminating low frequency component of a read signal and  $N$  is a constant based on a read error rate of servo data.

First, Applicant notes that, as discussed at length above regarding the §102(b) rejections, the Inoue '957 reference clearly fails to teach or suggest the use of recorded servo data comprising coded data, as recited by independent claim 7. In particular, Applicant points out that Inoue '957 merely teaches that when a servo pattern is read by an MR head, it is possible to avoid generating a DC offset when reading head positioning information of head positioning data, thereby making it possible to achieve correct positioning. (*See*, col. 4, lines 47-52). Such a disclosure cannot be construed, in any way, as teaching a DC free code method within the meaning of elements recited in claim 7.

Second, there is nothing in Inoue '957 that remotely teaches or suggests having a minimum magnetization reverse interval time  $T_{min}$  being less than or equal to the relation  $(-\ln N)/2\pi f_c$ , as required by claim 7. Applicants respectfully submit that merely asserting that the Inoue '957 reference teaches a DC free method and that the method renders the claim unpatentable without so much as a hint to the claimed  $T_{min}$  relation, is not only baseless but improper. If the Examiner sustains this rejection, Applicant invites the Examiner to submit proof that the Inoue '957 reference either suggests the use of the  $T_{min}$  relation or that artisans of ordinary skill will understand that any and all methods of DC suppression must necessarily invoke use of the  $T_{min}$  relation.

For at least these reasons, Applicants submit that amended independent claim 7 cannot be rendered unpatentable by the Inoue '957 reference. Moreover, as best as can be determined, none of the references of record whether considered alone, or in reasonable combination with Inoue '957, can cure the identified deficiencies of Inoue '957. As such, claim 7 stands patentable over the references of record. In addition, claim 8, which depends from claim 7 is patentable for at least the reasons presented with respect to claim 7 as well as for its additional recitations.

Further, because independent method claim 11 recites similar features to claim 7, claim 7 is also patentable for at least the reasons given with respect to claim 7. Accordingly, withdrawal of the prior art rejection of claims 7-8 and 11, under 35 U.S.C. § 103(a) is respectfully requested.

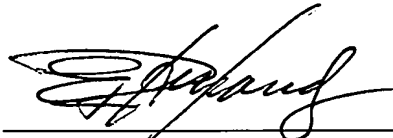
### III. Conclusion

All matters having been addressed and for the reasons presented above, Applicant respectfully requests the entry of this Amendment, the Examiner's reconsideration of this application, and the immediate allowance of pending claims 1-2, 4, 7-8, and 10-11.

Applicants' Counsel remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this matter.

Respectfully submitted,

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